# 1. Subbasin Assessment – Watershed Characterization

The federal Clean Water Act (CWA) requires that states and tribes restore and maintain the chemical, physical, and biological integrity of the nation's waters. States and tribes, pursuant to Section 303 of the CWA, are to adopt water quality standards necessary to protect fish, shellfish, and wildlife while providing for recreation in and on the nation's waters whenever possible. Section 303(d) of the CWA establishes requirements for states and tribes to identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). States and tribes must periodically publish a priority list (a "§303(d) list") of impaired waters. Currently this list must be published every two years. For waters identified on this list, states and tribes must develop a Total Maximum Daily Load (TMDL) for the pollutants, set at a level to achieve water quality standards. (In common usage, a TMDL also refers to the written document that contains the statement of loads and supporting analyses, often incorporating TMDLs for several water bodies and/or pollutants within a given watershed.)

This document addresses the South Fork Payette River, which was placed on Idaho's 1998 §303(d) list based primarily on desired future condition goals of the Boise National Forest Plan..

The overall purpose of the subbasin assessment (SBA) is to characterize the South Fork Payette River Subbasin and begin to identify sources of fine-grained sediment. The SBA is partitioned into four major sections: watershed characterization, water quality concerns and status, pollutant source inventory, and a summary of past and present pollution control efforts (Chapters 1 – 4).

## 1.1 Introduction

In 1972, Congress passed the Federal Water Pollution Control Act, more commonly called the Clean Water Act. The goal of this act was to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (Water Environment Federation 1987, p. 9). The act and the programs it has generated have changed over the years, as experience and perceptions of water quality have changed.

The CWA has been amended 15 times, most significantly in 1977, 1981, and 1987. One of the goals of the 1977 amendment was protecting and managing waters to insure "swimmable and fishable" conditions. This goal, along with a 1972 goal to restore and maintain chemical, physical, and biological integrity, relates water quality with more than just chemistry.

### Background

The federal government, through the U.S. Environmental Protection Agency (EPA), assumed the dominant role in defining and directing water pollution control programs across the country. The Department of Environmental Quality (DEQ) implements the CWA in Idaho, while the EPA oversees Idaho and certifies the fulfillment of CWA requirements and responsibilities.

Section 303 of the CWA requires DEQ to adopt water quality standards and to review those standards every three years (EPA must approve Idaho's water quality standards). Additionally, DEQ must monitor waters to identify those not meeting water quality standards. For those waters not meeting standards, DEQ must establish a TMDL for each pollutant impairing the waters. Further, the agency must set appropriate controls to restore water quality and allow the water bodies to meet their designated uses.

These requirements result in a list of impaired waters, called the "§303(d) list." This list describes water bodies not meeting water quality standards. Waters identified on this list require further analysis. An SBA provides a summary of the water quality status for water bodies on the §303(d) list. The *South Fork Payette River Subbasin Assessment* provides this summary for the currently listed waters in the South Fork Payette River Subbasin as well as several others that are not on the §303(d) list.

This SBA includes an evaluation and summary of the most recent and available water quality data, pollutant sources, and control actions in the South Fork Payette River Subbasin. While this assessment is not a requirement of a TMDL, DEQ performs the assessment to ensure impairment listings are up to date and accurate. A TMDL is an estimate of the current pollutant load and an estimate of the maximum pollutant amount that can be present in a water body and still allow that water body to meet water quality standards (Water quality planning and management, 40 Code of Federal Regulations 130). Consequently, a TMDL is water body- and pollutant-specific. A TMDL also includes individual pollutant allocations among various sources discharging the pollutant. The EPA considers certain unnatural conditions, such as flow alteration, a lack of flow, or habitat alteration, that are not the result of the discharge of a specific pollutant as "pollution." A TMDL is not required for water bodies impaired by pollution, but not specific pollutants. In common usage, a TMDL also refers to the written document that contains the statement of loads and supporting analyses, often incorporating TMDLs for several water bodies and/or pollutants within a given watershed.

## Idaho's Role

Idaho adopts water quality standards to protect public health and welfare, enhance the quality of water, and protect biological integrity. A water quality standard defines the goals of a water body by designating the use or uses for the water, setting criteria necessary to protect those uses, and preventing degradation of water quality through antidegradation provisions.

The state may assign or designate beneficial uses for particular Idaho water bodies to support. These beneficial uses are identified in the Idaho water quality standards and include the following:

- Aquatic life support – cold water, seasonal cold water, warm water, salmonid spawning, modified
- Contact recreation – primary (swimming), secondary (boating)
- Water supply – domestic, agricultural, industrial

- Wildlife habitats
- Aesthetics

The Idaho legislature designates uses for water bodies. Industrial water supply, wildlife habitats, and aesthetics are designated beneficial uses for all water bodies in the state. If a water body is unclassified, then cold water and primary contact recreation are used as additional default designated uses when water bodies are assessed.

An SBA entails analyzing and integrating multiple types of water body data, such as biological, physical/chemical, and landscape data to address several objectives:

- Determine the degree of designated beneficial use support of the water body (i.e., attaining or not attaining water quality standards).
- Determine the degree of achievement of biological integrity.
- Compile descriptive information about the water body, particularly the identity and location of pollutant sources.
- Determine the causes and extent of the impairment when water bodies are not attaining water quality standards.

## 1.2 Physical and Biological Characteristics

The South Fork Payette River Subbasin is located primarily in Boise County with the upper half of the Deadwood River watershed in Valley County (Figure 1). Based on Idaho Department of Water Resources (IDWR) spatial data, the subbasin contains approximately 813 square miles (IDWR 1990). The South Fork Payette River subbasin is designated as U.S. Geological Survey (USGS) cataloging unit (fourth field) 17050120. The subbasin contains the entire South Fork Payette River from its headwaters in the Sawtooth Mountains to its confluence with the Middle Fork Payette River near Garden Valley, Idaho. The South Fork Payette River subbasin is bounded on the north by the Salmon River Mountains, on the east by the Sawtooth Mountains and on the south by the Boise Mountains. Elevations of the South Fork Payette River range from approximately 8,920 feet at the headwaters (USGS 1992) to 3,000 feet at the confluence with the Middle Fork Payette River (USGS 1982).

### Climate

The South Fork Payette River subbasin is dominated by variable mountain weather patterns. Air movement patterns are primarily westerly (Hunt 1974). The annual weather cycle consists of cold winters and warm summers. In winter, the prevailing winds are from the west. These winds bring moderate winter temperatures and moisture from the Pacific Ocean. December and January are typically the coldest and wettest months of the year. Occasionally, the westerly winds give way to Arctic air masses that bring cold continental air temperatures. During the summer, the westerly winds of winter subside and continental climatic conditions prevail. July and August are typically the warmest and driest months of the year. (Abramovich et al. 1998)

Transitions in the seasons are marked by rapid weather changes. During the winter and early spring months, relatively warm and humid air masses can enter the subbasin causing rapid snowmelt. When rapid snowmelt combines with rainfall, rain-on-snow events occur. These events create saturated soils and high runoff that can trigger landslides. A large rain-on-snow event occurred in 1997 that resulted in numerous landslides and washed out roads in the South Fork Payette River subbasin. These landslides added a great deal of sediment to the existing sediment load in streams of the subbasin.

Climate stations for the South Fork Payette River subbasin are located at Garden Valley, Lowman, and Deadwood Dam. The periods of record, annual maximum air temperatures, annual minimum air temperatures, and annual total precipitation for these stations are summarized in Table 1.

**Table 1. Summary of period of record, annual maximum and minimum air temperatures and total annual precipitation for Garden Valley, Lowman and Deadwood Dam climate stations.**

| Station | Period of Record | Average Annual Maximum Air Temperature (F) | Average Annual Minimum Air Temperature (F) | Average Total Precipitation (inches) |
|---|---|---|---|---|
| Garden Valley | 8/1/1948 – 12/31/2001 | 62.2 | 31.8 | 24.51 |
| Lowman | 8/1/1948 – 11/30/2001 | 59.8 | 28.1 | 26.16 |
| Deadwood Dam | 12/6/1929 – 6/30/1975 | 55.1 | 22.4 | 32.26 |

The temperature regime for the subbasin is typical of Northern Hemisphere, mid-latitude mountainous locations. As noted earlier, temperatures peak in July and August and reach minimum levels in December and January (note Figures 2 – 4). Conversely, precipitation is highest in January and December and reaches minimum levels in July and August (Figure 5).

## Subbasin Characteristics

The South Fork Payette River flows generally from east to west from its origin in the west slopes of the Sawtooth Mountains to its confluence with the Middle Fork Payette River near Garden Valley, Idaho.

### Discharge and Hydrography

Discharge of water in the subbasin typically peaks in May and June, and minimum discharges are typically recorded in December and January (Figure 6). With the completion of Deadwood Dam in 1939, the discharge regime of the Deadwood River was significantly altered. Prior to the dam's construction, peak discharge typically occurred during May. Since completion of the dam, peak discharges now occur irregularly between July and August (Figure 6). Tributaries to the South Fork Payette River generally flow north or south, typically perpendicular to the South Fork Payette River. The tributaries and their watershed boundaries are shown in Figure 7.

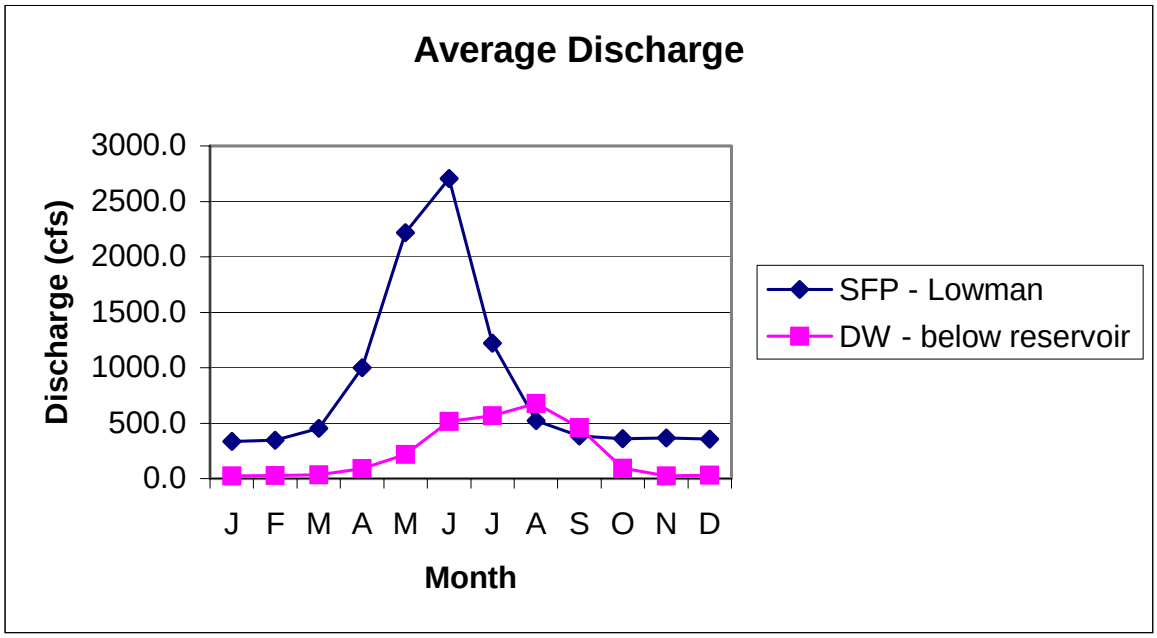


**Figure 6. Average Monthly Discharge (cubic feet per second [cfs]) of the South Fork Payette River at Lowman (736 observations, June 1941 through September 2002) and Deadwood River below Dam (912 observations, October 1926 through September 2002).**

## Geology and Soils

The South Fork Payette River Subbasin is contained in the Northern Rocky Mountain geomorphic province (Ross and Savage 1967). The geologic template of the subbasin is shown in Figure 8. The subbasin is situated on the Atlanta Batholith (Alt and Hyndman 1989), the southern portion of the Cretaceous granite formation commonly known as the Idaho Batholith (Hunt 1974). Rock types found in the batholith range from quartz gabbro to granite. The most common rocks are granodiorite and quartz monzonite (U. S. Department of Agriculture 1976). These granitic parent materials weather to form gravelly, coarse to moderately coarse soils.

The soils of the South Fork Payette River Subbasin include the Coski, Danskin, and Koppes soil series (U. S. Department of Agriculture 1976). Coski series soils are well–drained, gravelly, coarse and sandy loams formed in weathered granite. Coski soils have steep to very steep colluvial slopes (typically 40 – 60%) and occur at elevations ranging from approximately 3,937 feet (1,200 meters) to 6,562 feet (2,000 meters). Danskin series soils are well–drained, gravelly, loamy and coarse sands weathered from quartz monzonite on long, smooth side-slopes (typically 50 – 70%). Danskin soils occur at elevations ranging from 3,281 feet (1,000 meters) to 4,921 feet (1,500 meters). Koppes series soils are well-drained, loamy and coarse sands formed from colluvium weathered from granite. Koppes soils have steep and very steep slopes (typically 40 – 60%) and occur at elevations ranging from 3,281 feet (1,000 meters) to 5,906 feet (1,800 meters). Hazards of debris slides cut slope stability and fill slope stability range from low to high in all of these soils. (U. S. Department of Agriculture 1976)

The geology and soils, topography, and hydrology of the South Fork Payette River Subbasin combine to produce moderate to high sedimentation rates. A rough estimate of natural sedimentation rate is 80 (± 20) cubic yards of sediment per square mile per year (Wendt et al. 1973a). These authors estimate the total sedimentation rate to be 200 (± 50) cubic yards of sediment per square mile per year. The accelerated sedimentation rate is attributed to streamside road and cattle grazing activity (Wendt et al. 1973a).

## Topography

The terrain of the Northern Rocky Mountain geomorphic province is characterized by large, north-south oriented ridges separated by long, narrow valleys (Idaho Water Resource Board 1999). These characteristics are generally the result of block faulting and subsequent erosion of the granitic Atlanta Batholith. Elevation of the South Fork Payette River Subbasin ranges from approximately 10,810 feet (3,295 meters) at Mount Cramer to 3,000 feet (914 meters) at the confluence with the Middle Fork Payette River. Slopes along the South Fork Payette River are typically greater than 41% (Figure 9).

## Land Cover

The land cover of the South Fork Payette River Subbasin is dominated by forest vegetation (Figure 10). This vegetation varies considerably with elevation. Lower elevation areas are dominated by brush and grass communities, along with ponderosa pine and Douglas fir communities. Mid-elevation areas are dominated by Douglas fir and subalpine fir trees. Higher elevation areas are almost entirely covered with subalpine fir trees with some Douglas fir, Engleman spruce trees, and elk sedge (Wendt et al. 1973a).

## Land Types

The South Fork Payette River Subbasin is situated on the Boise and Sawtooth National Forests. The United States Forest Service (USFS) has classified the lands in the South Fork Payette Subbasin into land types (Figure 11). These land types are comprised of natural features that have resulted from geomorphic and climatic processes. Natural erosion and stability hazards are described for each land type in Wendt et al. (1973a, 1973b) and Larson and Rahm (1972).

## Fisheries

The Black Canyon Dam, built on the Payette River in 1924, blocked the migration of fish that have an anadromous life history in the subbasin. These fish include Chinook salmon, steelhead, and Pacific lamprey, which are now extirpated from the subbasin. The Idaho Department of Fish and Game has stocked rainbow trout, Atlantic salmon, Chinook salmon, Arctic grayling (*Thymallus arcticus*), bull trout, coho salmon (*Oncorhynchus kisutch*), kokanee, westslope cutthroat trout, Bear Lake cutthroat trout, fine spotted cutthroat trout, Henrys Lake cutthroat trout, and steelhead in the subbasin since 1967. Since 2001, stocking has been limited to rainbow trout, steelhead, and kokanee. Fishery management in the South Fork Payette River Subbasin is currently focused on natural production of wild trout (Idaho Department of Fish and Game 2001). Native or introduced fish that were found in the South Fork Payette River Subbasin (IDFG 2003, Zaroban 2003) are listed in Table 2.

**Table 2. Common name, scientific name and status of origin of fish native to or introduced (Zaroban et al. 1999) in the South Fork Payette River subbasin.**

| Common Name | Scientific Name | Origin |
|---|---|---|
| Atlantic salmon | *Salmo salar* | alien |
| brook trout | *Salvelinus fontinalis* | alien |
| bull trout | *Salvelinus confluentus* | native |
| chinook salmon | *Oncorhynchus tshawytscha* | native |
| cutthroat trout | *Oncorhynchus clarki* | native |
| kokanee | *Oncorhynchus nerka* | alien |
| longnose dace | *Rhinichthys cataractae* | native |
| mottled sculpin | *Cottus bairdi* | native |
| mountain whitefish | *Prosopium williamsoni* | native |
| Pacific lamprey | *Lampetra tridentatus* | native |
| rainbow trout/steelhead | *Oncorhynchus mykiss* | native |
| shorthead sculpin | *Cottus confusus* | native |
| sucker | *Catostomus sp.* | native |

The South Fork Payette River Subbasin contains two key watersheds for bull trout (Batt 1996). The Deadwood River key watershed contains the Deadwood River and tributaries above Deadwood Reservoir. The South Fork Payette River key watershed contains the South Fork Payette River and tributaries above the mouth of the Deadwood River, including the Deadwood River and tributaries below Deadwood Reservoir. All life history forms of bull trout are known to occur in both key watersheds (Jimenez and Zaroban 1998).

## Subwatershed and Stream Characteristics

The upper-elevation tributaries to the South Fork Payette River are typically contained in V-shaped valleys. The valleys become more shallow (U shaped) at middle and lower elevations of the subbasin. The surface area estimates (acres) of the 35 sixth-field, 12-digit (HUC6) watersheds in the subbasin are summarized in Table 3. Estimates of the minimum stream elevation (feet), maximum stream elevation (feet), segment length (miles), and drop in elevation (feet per mile) for the mainstem stream in each HUC6 are summarized in Table 4.

**Table 3. Surface area (acres) of the 35 HUC6 watersheds in the South Fork Payette River subbasin.**

| HUC6 Name | HUC6 Code | Acres |
|---|---|---|
| ALDER CREEK | 170501200103 | 13457 |
| BARON CREEK | 170501201102 | 14478 |
| BEAR CAMP | 170501200803 | 15471 |
| BIG PINE CREEK | 170501200202 | 11306 |
| BLUEJAY | 170501200801 | 13582 |
| BULL TROUT | 170501200902 | 23939 |
| DANSKIN POORMAN | 170501200102 | 25259 |
| DEADWOOD RESERVOIR | 170501200501 | 32232 |
| DEER CREEK | 170501200503 | 10746 |
| EIGHTMILE CREEK | 170501200604 | 18154 |
| FIVEMILE CREEK | 170501200603 | 7303 |
| GOAT CREEK | 170501201103 | 8034 |
| GRANDJEAN | 170501200804 | 8670 |
| HOLE IN THE WALL | 170501200201 | 17710 |
| JACKSON FENCE | 170501200602 | 16218 |
| KIRKHAM | 170501200601 | 24012 |
| LOWER CANYON | 170501201001 | 8385 |
| LOWER CLEAR CREEK | 170501200701 | 19632 |
| LOWER DEADWOOD | 170501200301 | 13280 |
| LOWER SF PAYETTE | 170501200101 | 7139 |
| MINK LAKE | 170501201101 | 12531 |
| NINEMILE | 170501200402 | 12226 |
| PINCHOT FALL | 170501201104 | 12572 |
| ROCK CREEK | 170501200605 | 10868 |
| SAMS LORENZO | 170501200302 | 16623 |
| SCOTT CREEK | 170501200401 | 10884 |
| TENMILE CREEK | 170501200805 | 21100 |
| UPPER CANYON | 170501201002 | 13314 |
| UPPER CLEAR CREEK | 170501200702 | 16913 |
| UPPER DEADWOOD | 170501200502 | 26806 |
| UPPER SF PAYETTE RIVER | 170501201105 | 11921 |
| WARM SPRING | 170501200901 | 12967 |
| WARM SPRINGS | 170501200403 | 17922 |
| WHITEHAWK | 170501200404 | 10988 |
| WOLF | 170501200802 | 9322 |

**Table 4. Estimates of the minimum stream elevation (feet), maximum stream elevation (feet), segment length (miles) and drop in elevation (feet per mile) for the mainstem stream.**

| HUC6 Name | HUC6 Code | Min Elev. | Max Elev. | Length | Ft/Mi |
|---|---|---|---|---|---|
| ALDER CREEK | 170501200103 | 3117 | 5118 | 7.58 | 263.9842 |
| BARON CREEK | 170501201102 | 5151 | 9023 | 9.03 | 428.7929 |
| BEAR CAMP | 170501200803 | 4839 | 5004 | 3.48 | 47.41379 |
| BIG PINE CREEK | 170501200202 | 3400 | 7040 | 8.53 | 426.7292 |
| BLUEJAY | 170501200801 | 4360 | 4593 | 5.23 | 44.55067 |
| BULL TROUT | 170501200902 | 5676 | 8038 | 6.72 | 351.4881 |
| DANSKIN POORMAN | 170501200102 | 3117 | 3210 | 7.71 | 12.06226 |
| DEADWOOD RESERVOIR | 170501200501 | 5250 | 5510 | 9.02 | 28.82483 |
| DEER CREEK | 170501200503 | 5510 | 7218 | 10.22 | 167.1233 |
| EIGHTMILE CREEK | 170501200604 | 4320 | 8210 | 12.4 | 313.7097 |
| FIVEMILE CREEK | 170501200603 | 4225 | 7546 | 7.87 | 421.9822 |
| GOAT CREEK | 170501201103 | 5250 | 8941 | 8.1 | 455.679 |
| GRANDJEAN | 170501200804 | 5004 | 5151 | 3.29 | 44.68085 |
| HOLE IN THE WALL | 170501200201 | 3210 | 3720 | 12.1 | 42.14876 |
| JACKSON FENCE | 170501200602 | 4120 | 4360 | 6.87 | 34.9345 |
| KIRKHAM | 170501200601 | 3720 | 4120 | 12.89 | 31.03181 |
| LOWER CANYON | 170501201001 | 4839 | 5824 | 5.49 | 179.4171 |
| LOWER CLEAR CREEK | 170501200701 | 3800 | 5510 | 12.43 | 137.5704 |
| LOWER DEADWOOD | 170501200301 | 3720 | 4240 | 7.82 | 66.49616 |
| LOWER SF PAYETTE | 170501200101 | 2953 | 3117 | 4.08 | 40.19608 |
| MINK LAKE | 170501201101 | 5151 | 6152 | 9.23 | 108.4507 |
| NINEMILE | 170501200402 | 4760 | 5086 | 4.6 | 70.86957 |
| PINCHOT FALL | 170501201104 | 6152 | 7087 | 4.43 | 211.0609 |
| ROCK CREEK | 170501200605 | 3759 | 7481 | 10.51 | 354.1389 |
| SAMS LORENZO | 170501200302 | 4240 | 4760 | 8.65 | 60.11561 |
| SCOTT CREEK | 170501200401 | 4760 | 7382 | 7.55 | 347.2848 |
| TENMILE CREEK | 170501200805 | 4360 | 7907 | 11.37 | 311.9613 |
| UPPER CANYON | 170501201002 | 5824 | 7054 | 5.07 | 242.6036 |
| UPPER CLEAR CREEK | 170501200702 | 5510 | 7620 | 9.52 | 221.6387 |
| UPPER DEADWOOD | 170501200502 | 5510 | 6808 | 14.24 | 91.15169 |
| UPPER SF PAYETTE RIVER | 170501201105 | 7087 | 8531 | 4.37 | 330.4348 |
| WARM SPRING | 170501200901 | 4593 | 5676 | 9.42 | 114.9682 |
| WARM SPRINGS | 170501200403 | 5086 | 6808 | 12.13 | 141.9621 |
| WHITEHAWK | 170501200404 | 5086 | 7464 | 7.7 | 308.8312 |
| WOLF | 170501200802 | 4593 | 4839 | 4.11 | 59.85401 |

## 1.3 Cultural Characteristics

The South Fork Payette River Subbasin is sparsely populated and contains the unincorporated communities of Garden Valley and Lowman. Demographic data are unavailable for these two communities.

### Land Use

The land use of the South Fork Payette River Subbasin is dominated by forest (Figure 12). Based on acreage estimates from IDWR spatial data, forest land uses make up 99.8% of the subbasin (IDWR 1990). The remaining 0.2% of land is gravity and sprinkler irrigation land, range, urban, and water.

## Land Ownership, Cultural Features, and Population

Public land dominates the South Fork Payette River Subbasin, with the USFS as the primary land management agency for the Boise National Forest (Figure 13). Based on acreage estimates from IDWR spatial data (IDWR 1992), public ownership makes up 99.9% of the subbasin. The U.S. Bureau of Land Management, open water, and private and state ownership account for the remaining 0.1% of the land.

## History and Economics

### First Nations

Central Idaho was home to the tukudeka or "mountain sheep eater" Native Americans (Osgood 2001). The U.S. government referred to these people as the Weiser Indians. The Weiser Indians were primarily the Shoshoni and Bannock Tribes, with some bands of Northern Paiute and Nez Perce Tribes represented in the population. It is estimated that people living a semi-nomadic life style entered what is now known as Idaho approximately 13,000 years ago (Smith 1983). There is evidence of Northern Shoshoni residence in the subbasin for 8,000 years or more (Ames 1982, Smith 1983). Archaeological evidence suggests Native Americans camped at Big Falls portage where they captured Chinook salmon and steelhead two thousand years ago. Native Americans camped at Deadwood campground and fished for Chinook salmon and steelhead fifteen hundred years ago. Occupation of the South Fork Payette River subbasin by Native Americans continued at least through August 1876, when Charles Jones (a local newspaper editor) encountered a group of Weiser Indians and their horses in the mountains above Garden Valley.

### European Occupation

The first people of European descent to inhabit the South Fork Payette River Subbasin were trappers and fur traders who arrived in the early 1800s. In 1818, the Hudson Bay Company named the Payette River in honor of fur trapper Francois Payette. From 1820 to 1845, British, Canadian, and American fur companies competed for beaver pelts in Oregon Country, which included present day Idaho. Britain relinquished its claim to the Oregon territory in 1846 as the fur trade was in decline due to over-trapping (deliberate creation of "fur deserts" to discourage American encroachment) and changes in garment fashions. In the 1860s, placer mining was conducted in the South Fork Payette. There was low gold production in the South Fork subbasin. (Smith 1983, Osgood 2001)

With the discovery of gold in the Boise River basin in 1862, some miners moved to the South Fork Payette to hunt, fish, and farm to supply Boise River miners with meat (including immense quantities of fish from fish traps), produce, and dairy products. Along with the remaining trappers, these immigrants became the first European settlers of the South Fork Payette River Subbasin. Some of the most notable settlers and occupants included Nathaniel Lowman, Emile Grandjean, William Crouch, and Merle Banks (Osgood 2001).

Dredge and placer mining had significant impacts on the South Fork Payette River even though the South Fork never yielded much gold. In 1904, an earthen dam and powerhouse were constructed at Grimes Pass to provide power to commercial dredges in the Boise River. This initial dam washed out before power lines could be completed. The earthen dam was replaced by a wooden structure, Grimes Pass Dam, in 1907. Grimes Pass Dam washed out in 1943 and was never replaced. In 1905, miners blasted a 0.25 mile long tunnel, measuring ten feet high and 20 feet wide, at the South Fork Payette River oxbow. The entire flow of the South Fork was diverted to allow mining of the river bed. The South Fork yielded an average of $0.37 worth of gold per day according to one miner. In 1906, plans to develop a

hydroelectric plant at the oxbow site were announced. The USFS did not permit this development, amid allegations the gold had been seeded in the river the previous year to support exaggerated claims of the plant's potential (Osgood 2001).

Timber harvesting activities began to support the trappers, miners, and settlers. The lumber produced was used for cabins, flumes, sluice boxes, as well as other uses. Early commercial logging in the South Fork Payette River Subbasin was done with teams of oxen. The logs were driven down the river during high water to the Horseshoe Bend sawmill. Management of the timber harvesting began soon after the Sawtooth Forest Reserve was established in 1905 (Smith 1983).

Domestic livestock grazing began soon after mining activity began in 1862. Herds of sheep being trailed from Oregon to Nebraska passed through the area in the 1870s. This sheep herding stopped in 1898 when Wyoming passed a quarantine law. As a result of the quarantine law, sheep producers spent more time in southern Idaho. Unrestricted grazing ended shortly after the forest reserve was established in 1905.

Recreational uses received little attention from the 1860s to 1925. Civilian Conservation Corps labor became available in 1933 and was used to construct recreational facilities (primarily campgrounds) in the South Fork Payette River Subbasin between 1933 and 1940. Since the 1940s, backpacking, cross-country skiing, river floating, summer home, and off-road vehicle uses have all increased dramatically.

### Boise National Forest

The national forest system was created in 1891 with the passage of the Forest Reserve Act. President Theodore Roosevelt established the Sawtooth Forest Reserve in 1905. The Sawtooth Forest Reserve eventually was divided into the Boise, Payette, and Sawtooth National Forests in 1908.

### Roads

The South Fork Payette River road was completed to Lowman in 1914. The Scott Mountain road into Deadwood Reservoir was completed in 1931. The Clear Creek-to-Stanley road was in existence by 1922. State Highway 21 (Boise to Stanley) opened as a through route in 1965 and was completed to highway standards in 1975. Construction on the Banks-Lowman road was completed in the mid-1990s. In the deeper canyon sections of the river, this road actually acts as a sediment and rock collector and prevents some sedimentation.

Numerous roads have been constructed for resource extraction and are subsequently used for back-country access and recreation. The watersheds in the Sawtooth Wilderness Area of the upper subbasin are roadless (Figure 14).

## Dams

Two dams, Grimes Pass dam and the Deadwood Dam, have been constructed in the South Fork Payette River Subbasin. . The Grimes Pass dam was first constructed in 1904 and was washed out in 1943. The Grimes Pass Dam was never rebuilt. The Deadwood Dam was completed in 1931. The Deadwood dam impounds 3,055 acre Deadwood Reservoir, which extends 3.5 miles upstream (Smith 1983).

## Recreation

The Idaho State-designated Ponderosa Pine Scenic Byway lies partly within this management area. The South Fork Payette River corridor features river-oriented recreation, with rafting, kayaking and fishing as the major uses. There are also four developed campgrounds in the corridor, one in the Clear Creek drainage, and one at Bull Trout Lake. Dispersed recreation in the rest of the management area includes hiking, hunting, camping, fishing, ATV use, snowmobiling and horseback riding. Trails in the Tenmile/Black Warrior and Red Mountain recommended wilderness areas feature non-motorized recreation in a semi-primitive setting. Much of the use in this area comes from the Treasure Valley, although recreationists come from around the country and world to raft and kayak the South Fork Payette River. A recreation fee for parking along the South Fork Payette River is now charged river users. This area is in Idaho Fish and Game Management Units 33 and 35. Recreation special uses include several river-running outfitter and guide operations and recreation residence tracts (Long Creek, Camp Creek, Bear Creek, and Wapiti Creek) found in the South Fork Payette River corridor and along Clear Creek.